

NWS Preparation for GOES-R

Risk Reduction Annual Meeting

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NOAA/NWS



Outline



- NWS Perspective of GOES-R & JPSS Program Status
- NOAA planning for future weather operations
- Preparation activities for GOES-R
- Future operations
 - Proving Ground Activities
 - Research and Development



NWS Perspective

GOES-R and JPSS Program Status



GOES-R

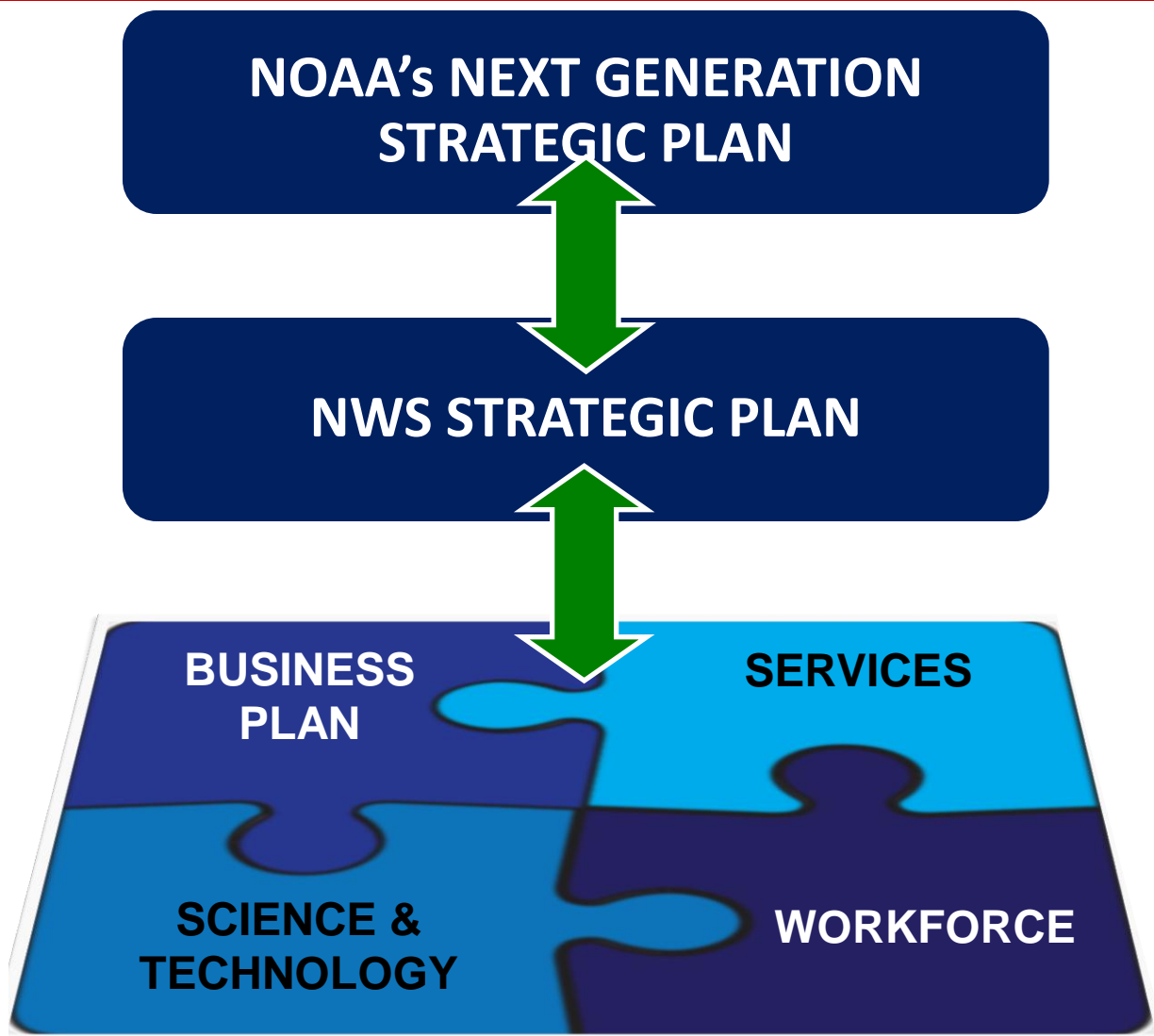
- Impacted by Budget Pressures (like all other NOAA activities)
- NWS working with GOES-R Program Office on future direction of PG & R3
 - links to testbeds and operational proving ground
 - development of "future capabilities" aligned with weather office of the future plans
 - Operational prioritization - focus development given budget constraints

JPSS

- Hoping for anomaly free NPP launch
- Major NOAA emphasis area
 - get this program on track given current budget pressures
- Minimizing anticipated Polar Data gap crucially dependant on FY12-FY13 funding
- Major emphasis of NWS activities in response
 - NWP impact analysis
 - operational impact analysis
 - contingency planning
- Environmental Satellite Users Group meets in November to discuss cross-organizational collaboration

NOAA planning for future weather operations

Planning Flow Down





NOAA planning for future weather operations

SSD Capstone Document → S&T Roadmap

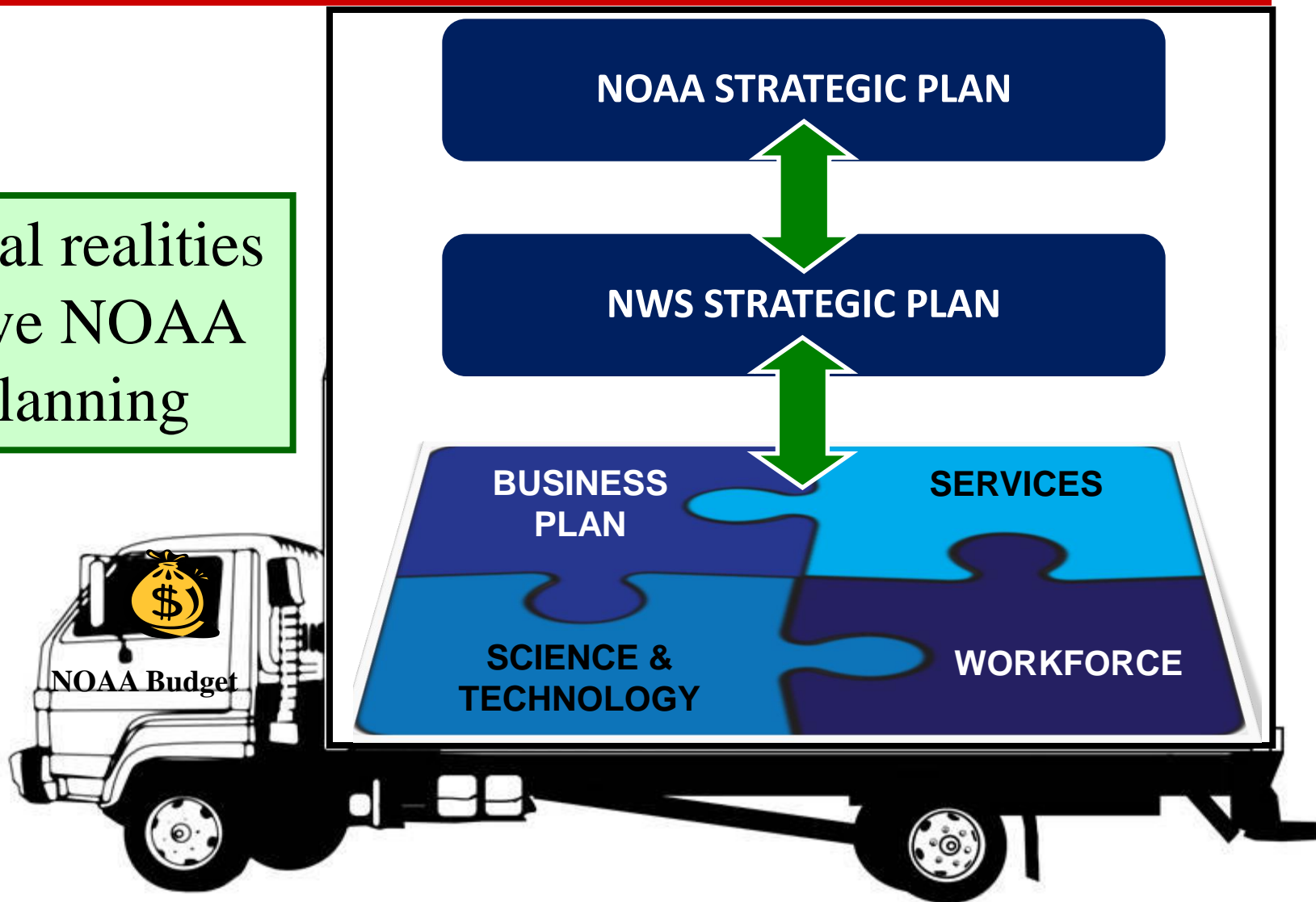


- The NWS is moving from a “product-based” enterprise to a “service-based” enterprise.
- Warn on Forecast requires a revamping of the supporting observation and analysis systems to better observe the boundary layer processes for the numerical modeling system.
- Integrating observations from separate systems into an integrated observing and analysis system is a key challenge.
- Integrated observation networks, advanced computers, and improved environmental modeling to produce environment information must be intelligently targeted to best meet customer needs.
- The NWS must be able to move and interrogate data packages in a manner and speed such that decision support is provided to the community long before an event occurs.

NOAA planning for future weather operations

Driving Elements

Fiscal realities
drive NOAA
planning





NOAA planning for future weather operations

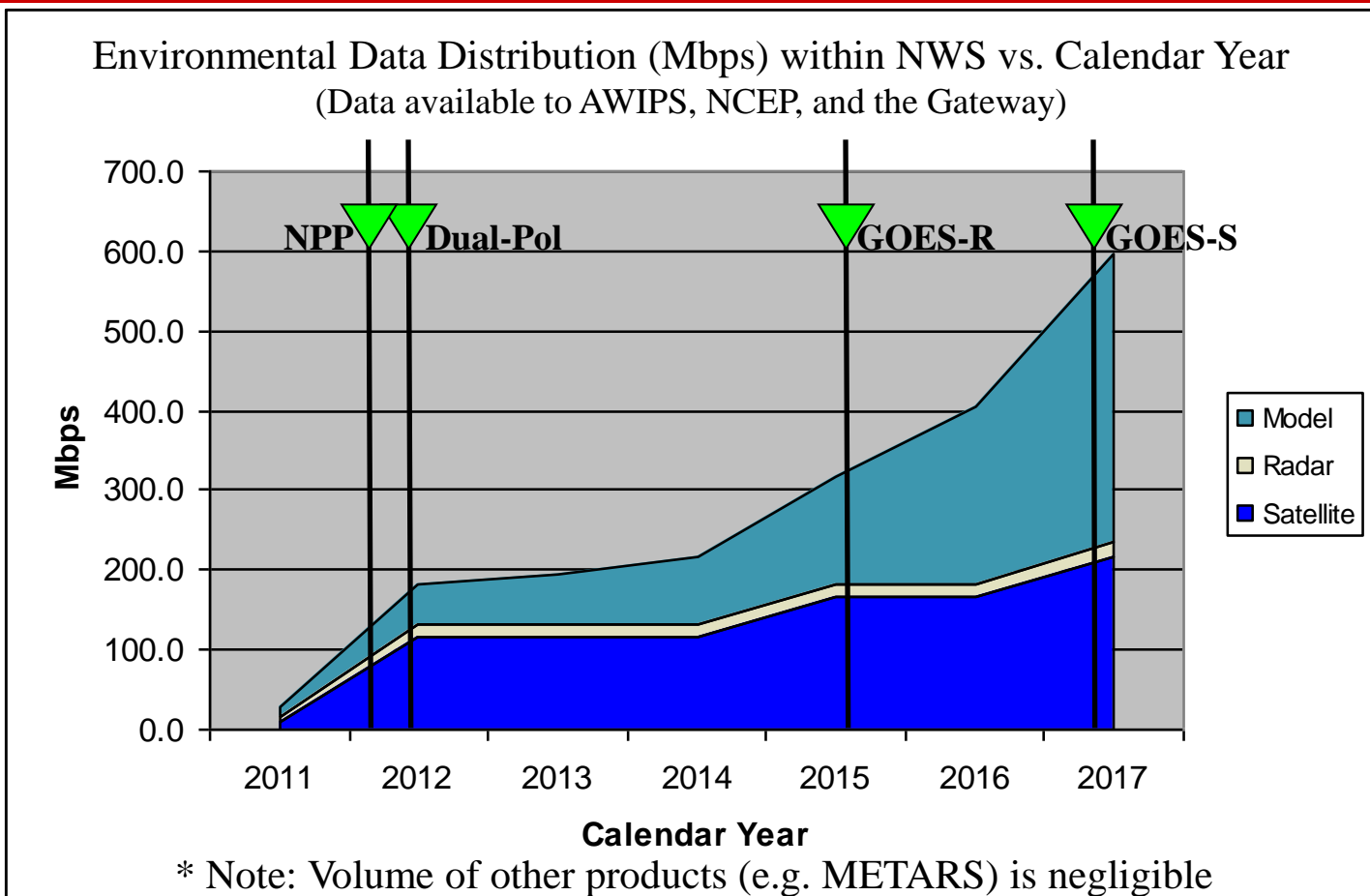
Fiscal Challenges



- **NOAA's Challenge**
 - Strong downward budget pressures; NOAA must urgently identify potential cost reductions and preserve critical NOAA mission delivery
 - NOAA must re-engineer its approach to its observing system architecture to reduce costs
 - Importance of observations to NOAA's mission dictates a thorough analysis to ensure there are no critical impacts; however, the current speed of federal budget decision making will require input now.
- **Current Activity – Observing System Requirements Prioritization**
 - Prioritize Observation Requirements and Observing Systems for Priority 1 "Lives and Property" observation types

Preparing for GOES-R

Notional Data Volume Assumptions



Observing Systems and Models are driving bandwidth growth and we expect enormous growth over the next decade



Preparing Forecasters for GOES-R



• Proving Ground ↔ Risk Reduction

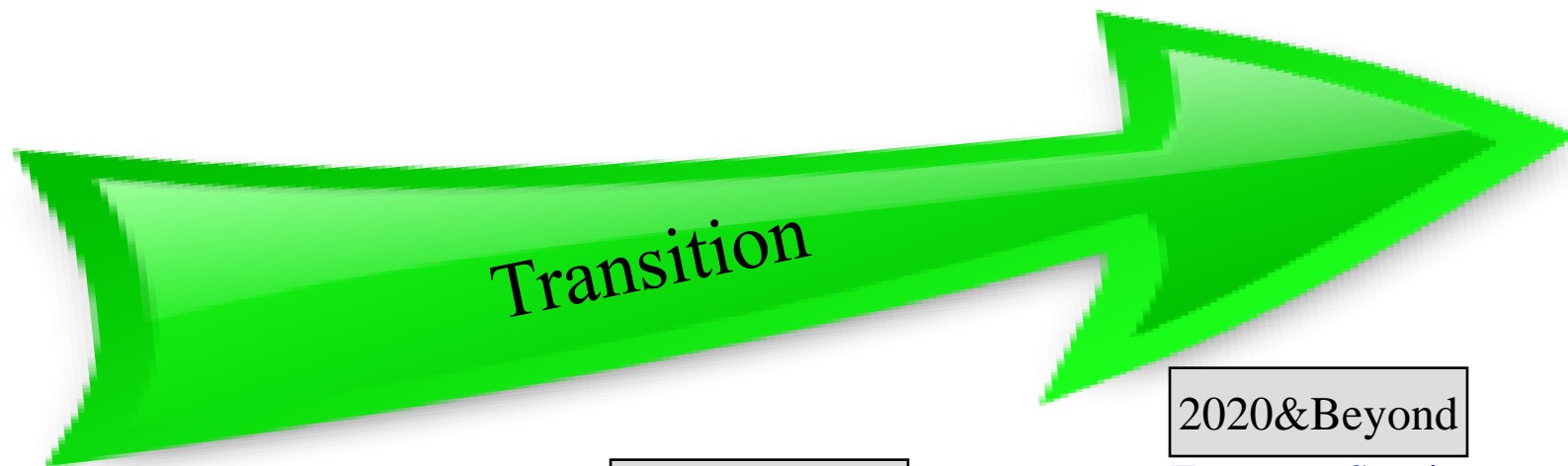
- GOES-R Proving Ground has rapidly expanded to demonstrate GOES-R capabilities in NWS-NCEP-Centers, -WFOs, -RFCs, NESDIS/SAB, Air Quality Community, etc.
- With GOES-R Option 2 deviation, many of these capabilities are now not well defined, desire for increasing PG focus on development /demonstration of “future capabilities”
- Would like to see increasing R3 R2O activity within PG to support “future capabilities”
 - Short Term and Long Term Objectives
- Working on prioritizing NWS demonstrations through a governance structure that represents operational need areas from each NWS Corporate Board Member
 - Necessary from perspective of prioritization of R2O efforts within NWS given expected contracting budgets outlook
 - Necessary from perspective of coordination with related development activities to coincide with related development timelines (NextGEN, AWIPSII, NWP/HPC/Data Assimilation, IT Readiness, etc.)
- PG expansion to Polar
- PG relationship to Testbeds and NWS Operational PG is evolving

• Training

- Importance of continued CIMMS, CIRA, SpORT involvement and training development
- In this dynamic fiscal and ground system development environment...need to stay flexible
 - Vitally important that Training Function stay closely coupled to “future capabilities” R2O
- Often, some of the best operational feedback comes through the training community...this feedback needs to be considered in operational prioritization

Future Operations

Proving Ground – Risk Reduction



2009-2013

Focus on Products

- Day 1
- GOES-R Risk Reduction

2011-2019

Prepare & Implement Fusion

- Evolve fusion concepts
- Implement NWS Roadmaps
- Test concepts operationally
- Transition to service focus

2020&Beyond

Focus on Services

- Improve fusion support
- Fully Implement service focus

Developers ↔ Forecasters

Future Operations Research and Development

- Moving from product centric approach to a more integrated approach
- Data fusion definition¹ and example

The use of techniques that combine data from multiple sources and gather that information in order to achieve inferences, which will be more efficient and potentially more accurate than if they were achieved by means of a single source.

Satellite

ABI channels 2, 7, 14

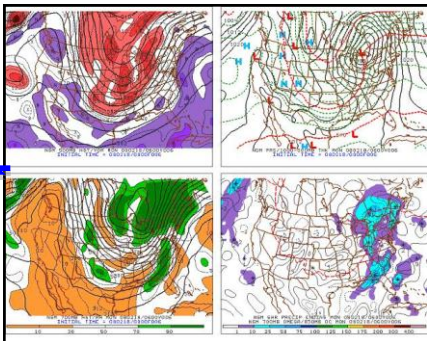
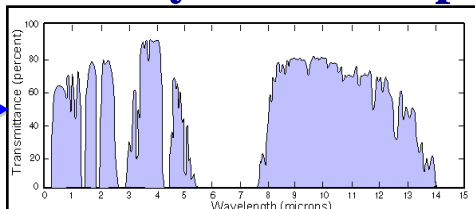
Cloud Mask

Cloud Phase

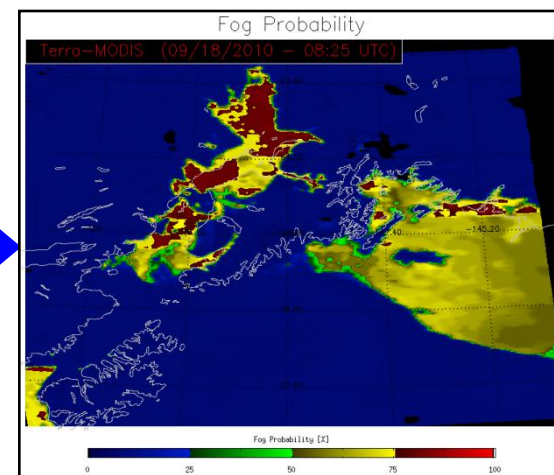
Solar zenith angle



Clear Sky RTM Output



Data
Integration and
Fusion



Fog Probability

NWP Data

¹Definition source: Wikipedia

http://en.wikipedia.org/wiki/Data_fusion



Wrapping Up

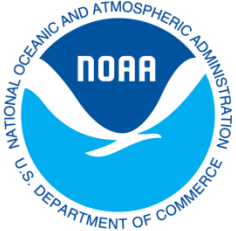
- **NWS Perspective on Program Changes**
 - funding changes make short term planning challenging
 - present opportunity to steer multiple efforts to better support future weather operations
- **Weather Enterprise planning activities are maturing**
 - Services Focus
 - Warn-on Forecast
- **Extrapolation of legacy operations is NOT a good design strategy for future operations**
 - Forecaster focused on service tailoring & longer lead warnings
 - Greater Dependence on NWP and rapidly updated data assimilation SA
 - Expect much more data...more products does NOT equate to better forecasts...services data fusion & integration crucial
- **GOES-R Prep**
 - PG, Training, R3...Evolve to support future operations
 - IT Infrastructure Re-design



QUESTIONS?
Discussion for tomorrow's
break out sessions?



Backup



GOES-R Baseline and Option 2 Products



GOES-R Baseline Products	GOES-R Option 2 Products
Aerosol Detection (Including Smoke and Dust)	Aerosol Particle Size
Aerosol Optical Depth: AOD & Suspended Matter	Aircraft Icing Threat
Volcanic Ash: Detection and Height	Cloud Ice Water Path
Cloud and Moisture Imagery	Cloud Layers/Heights
Cloud Optical Depth	Cloud Liquid Water
Cloud Particle Size Distribution	Cloud Type
Cloud Top Phase	Convective Initiation
Cloud Top Height	Enhanced "V" / Overshooting Top Detection
Cloud Top Pressure	Low Cloud and Fog
Cloud Top Temperature	Tropopause Folding Turbulence Prediction
Hurricane Intensity	Visibility
Lightning Detection: Events, Groups & Flashes	Probability of Rainfall
Rainfall Rate / QPE	Rainfall Potential
Legacy Vertical Moisture Profile	Absorbed Shortwave Radiation: Surface
Legacy Vertical Temperature Profile	Downward Longwave Radiation: Surface
Derived Stability Indices	Upward Longwave Radiation: Surface
Total Precipitable Water	Upward Longwave Radiation : TOA
Clear Sky Masks	Ozone Total
Downward Shortwave Radiation: Surface	SO ₂ Detection
Reflected Shortwave Radiation: TOA	Flood/Standing Water
Derived Motion Winds	Ice Cover
Fire/Hot Spot Characterization	Snow Depth (over Plains)
Land Surface (Skin) Temperature	Surface Albedo
Snow Cover	Surface Emissivity
Seas Surface Temperature (Skin)	Vegetation Fraction: Green
Radiances	Vegetation Index
	Currents
	Currents: Offshore
	Sea and Lake Ice: Age
	Sea and Lake Ice: Concentration
	Sea and Lake Ice: Motion
ABI	GLM



Preparing for GOES-R Ground Readiness Project

